DECserver 90M

digital™

Owner’s Manual

Part Number : EK-DSRVH-OM. A01

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ATTENTION	Le DECserver 90M n’a pas été conçu pour fonctionner avec des réseaux de télécommunication ou des modules ISDN (Integrated Services Digital Network).
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取扱説明書に従って正しい取り扱いをして下さい。

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About This Manual

This manual describes the procedures used to install and troubleshoot the DECserver™ 90M.

Document Structure

This manual contains the following three chapters and one appendix:

- Chapter 1 provides an overview of the DECserver 90M features.
- Chapter 2 describes selected methods of installing the DECserver 90M.
- Chapter 3 describes troubleshooting techniques.
- Appendix A lists DECserver 90M specifications.

For software information, refer to the DECserver Network Access Software Installation documentation.

Related Documentation

- *LAT™ Network Concepts*
- *Network Access Server Commands*
- *Network Access Server Management*
- *Network Access Server Problem Solving*
- *DECserver Network Access Software Installation (MS-DOS®, OpenVMS™, ULTRIX™, or UNIX®)*
- *DEChub™ 90 Owner's Manual*
- *OPEN DECconnect™ Applications Guide*

Conventions

This manual uses the following conventions:

Convention	Meaning
`special type`	This special type indicates system output or user input.
Ctrl/*X*	Hold down the Control key and simultaneously press the key specified by X. The DECserver displays this key combination as ^X.
UPPERCASE	Uppercase letters in command lines indicate keywords that must be entered. You can enter keywords in either uppercase or lowercase. You can abbreviate command keywords to the smallest number of characters that distinguish the keyword to the DECserver.
CAUTIONS	Provide information to prevent damage to equipment or software.
NOTES	Provides general information about the current topic.

1

Overview

This chapter provides an overview of the DECserver 90M and its features.

1.1 Description

The DECserver 90M is a multisession network access server designed to operate in multivendor environments. The DECserver 90M can be configured as a standalone device or as a module in the DEChub 90 Ethernet backplane.

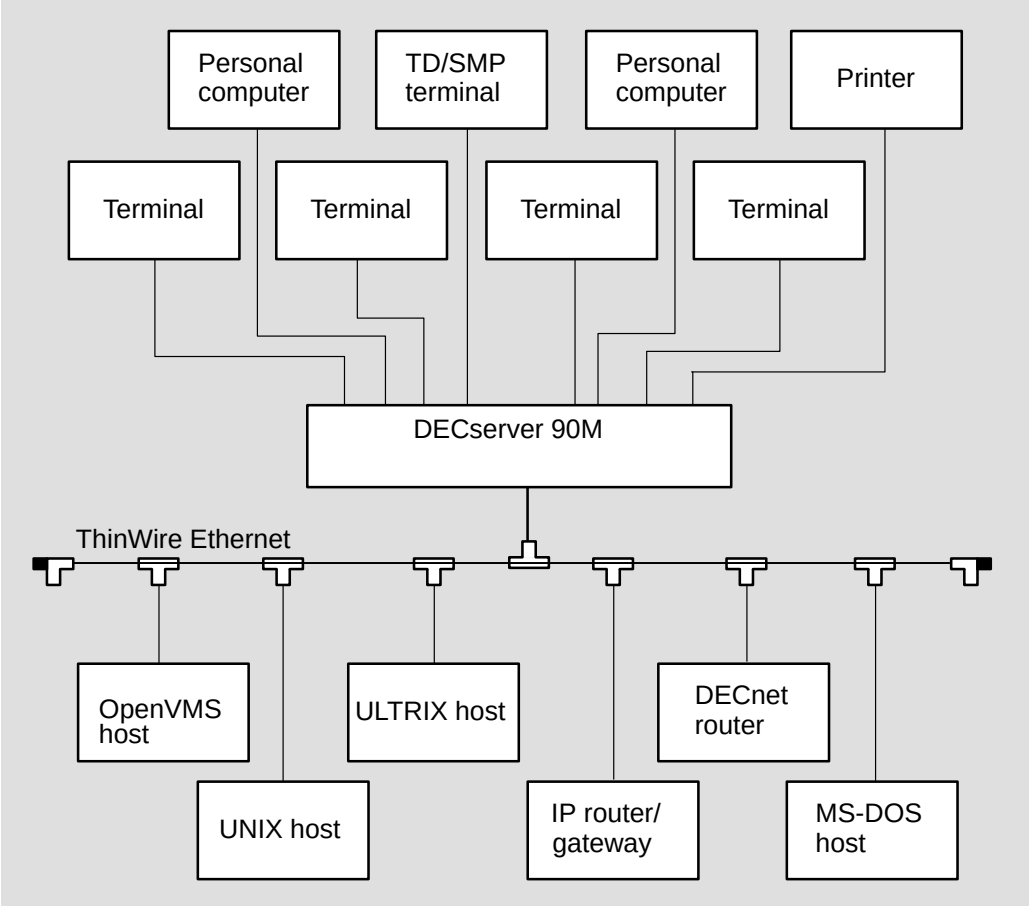
The DEChub 90 is a multifunction Ethernet backplane that provides mounting, power, and connections for up to eight work group local area network (LAN) products.

The DECserver 90M has the capability to:

- Downline load software using DECnet™ Maintenance Operation Protocol (MOP) or TCP/IP Bootstrap Protocol (BOOTP).
- Attach to a ThinWire™ or 10BaseT Ethernet network.
- Support eight asynchronous devices.
- Support Open DECconnect network.
- Load software from Flash RAM. (For versions configured with Flash RAM, no load host is required.)

Figure 1–1 shows a typical DECserver 90M configuration in a ThinWire Ethernet LAN.

Figure 1–1: DECserver 90M Connection



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1.2 Features

In addition to the previously mentioned capabilities, the DECserver 90M supports the following standard features and protocols:

- Rack mountable in the DEChub 90 Ethernet backplane
- Ready-in/ready-out or XON/XOFF flow control
- Manageable through remote console facility on OpenVMS, ULTRIX, or UNIX systems
- Manageable using Terminal Server Manager (TSM) software (OpenVMS only)
- Kerberos-based user authentication support
- Command line recall and editing
- 3270 Terminal Emulator (TN3270) support
- Domain Name System (DNS) support

- Port characteristics
  - 8-wire modular jack - MJ8 (also known as RJ45)
  - Individual port status LEDs
  - 6-wire control signaling
- Protocols
  - Bootstrap Protocol (BOOTP)
  - Compressed Serial Line Internet Protocol (CSLIP)
  - LAT Protocol
  - Maintenance Operation Protocol (MOP)
  - Point-to-Point Protocol (PPP)
  - Serial Line Internet Protocol (SLIP)
  - Simple Network Management Protocol (SNMP)
  - Telnet
  - Terminal Device/Session Management Protocol (TD/SMP)
  - Trivial File Transfer Protocol (TFTP)

Figure 1–2 calls out the DECserver 90M controls, indicators, and connectors. Table 1–1 provides a description of these features.

Figure 1–2: DECserver 90M Hardware

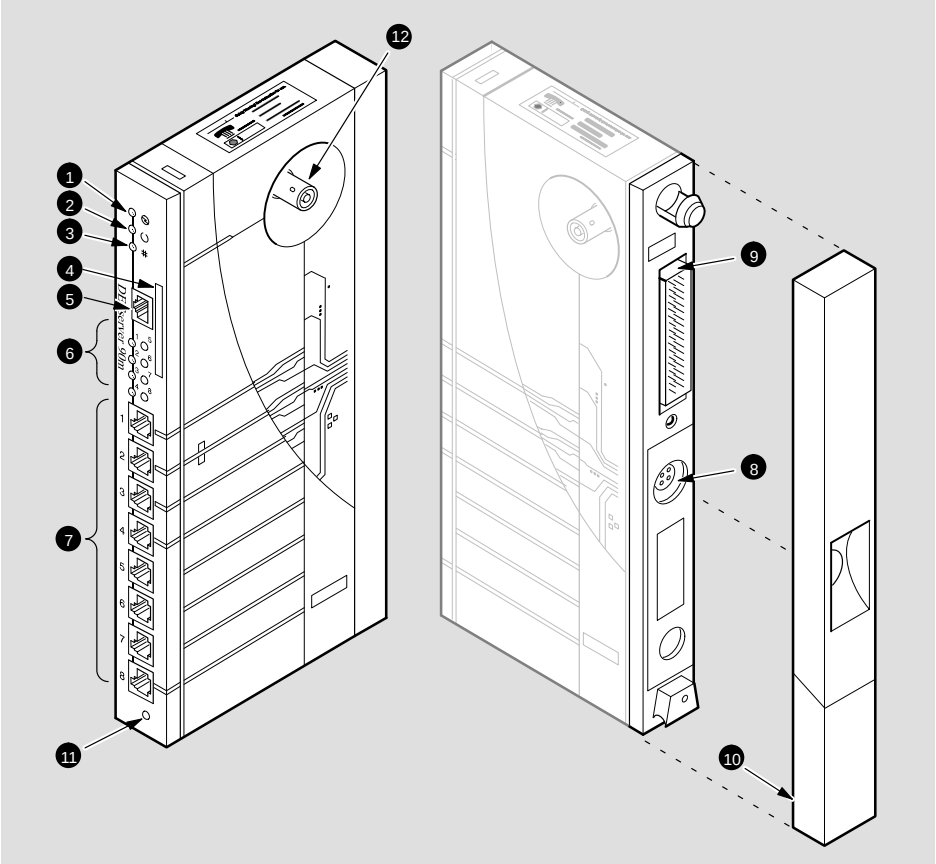

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Table 1–1: Controls, Indicators, and Connectors

	Item	Description
1	Power Indicator	Turns on when +5 volts are supplied to the DECserver 90M.
2	System OK Indicator	Turns on when the DECserver 90M successfully completes the ROM-based self-tests.
3	Network OK Indicator	Turns on when you connect the DECserver 90M to a properly terminated network. Blinks while the DECserver 90M loads or dumps software.
4	Ethernet Address Label	Displays the DECserver 90M Ethernet address.
5	10BaseT Connector	Connects the DECserver 90M to the network. Not used when you install the DECserver 90M in a DEChub 90 Ethernet backplane.
6	Port Activity Indicators	Consists of eight LEDs, each corresponding to a device port on the DECserver 90M. Each port activity LED turns on when the associated port is in use. These LEDs blink when port activity is detected and continue blinking until port data transfer stops.
7	Port Connectors (MJ8)	Connects the peripheral devices to the DECserver 90M.
8	Power Connector	Connects the power source to the standalone DECserver 90M. Not used when you install the DECserver 90M in a DEChub 90 Ethernet back-plane.
9	Backplane Connector	Connects the DECserver 90M power source and network interface to a DEChub 90 Ethernet backplane.
10	Back Cover	Covers the backplane connector and mounting assembly. Present on standalone units only.
11	Reset Switch	Resets the DECserver 90M to the factory-default characteristics.
12	Network Connector (BNC)	Connects the DECserver 90M to the ThinWire network. Not used when you install the DEC-server 90M in a DEChub 90 Ethernet backplane.

2

Installation

The DECserver 90M can be installed as a standalone device – on a tabletop or mounted to a wall – or added to the DEChub 90 Ethernet backplane.

Before you begin the hardware installation — if Flash RAM is not present — ensure that the software has been properly installed. Refer to the appropriate DECserver Network Access Software Installation documentation.

Complete the installation by:

- Installing the DECserver 90M hardware
- Running the DECserver 90M self-tests
- Loading the DECserver Network Access Software
- Verifying the operation of the DECserver 90M ports

2.1 Installing the DECserver 90M Hardware

The following sections describe how to install the DECserver 90M hardware as a standalone device or in a backplane.

2.1.1 Standalone Installation

Depending on your configuration, you can install the DECserver 90M as a tabletop device or on a wall by performing the following steps:

Wallmount Only:

1. Remove the back cover (refer to Figure 2–1).

   a. Insert a small screwdriver into the top mounting hole of the cover.

   b. Lift up the latch on the back cover of the unit.

   c. Pull the top of the cover away from the unit and down to remove it.

2. Use the back cover as a template and position each of the #8 1-inch mounting screws (not supplied).

3. Secure the mounting screws.

4. Replace the back cover on the unit.

Tabletop and Wallmount:

5. Connect the DECserver 90M BNC connector to a properly configured Thin-Wire network as shown in Figure 2–2.
   or
   Connect the 10BaseT connector to a properly configured 10BaseT network as shown in Figure 2–3.

CAUTION

You should choose only a ThinWire or 10BaseT connection. If you connect to both, the connection will not function properly.

6. Verify that the power LED is on and that the DECserver 90M is running the self-tests.

NOTE

Chapter 1 provides an illustration of the DECserver 90M hardware and descriptions of the LED indicators.

7. Optionally, attach a device configured with the following settings to the console port (default is port 1) using a cable terminated with an MJ8-compatible (RJ45) plug.

Character Size	8
Flow Control	XON
Parity	NONE
Stop Bits	Dynamic
Input Speed	9600 baud
Output Speed	9600 baud

8. Verify that the DECserver 90M successfully ran all of the self-tests.

Figure 2–1: Removing the Back Cover

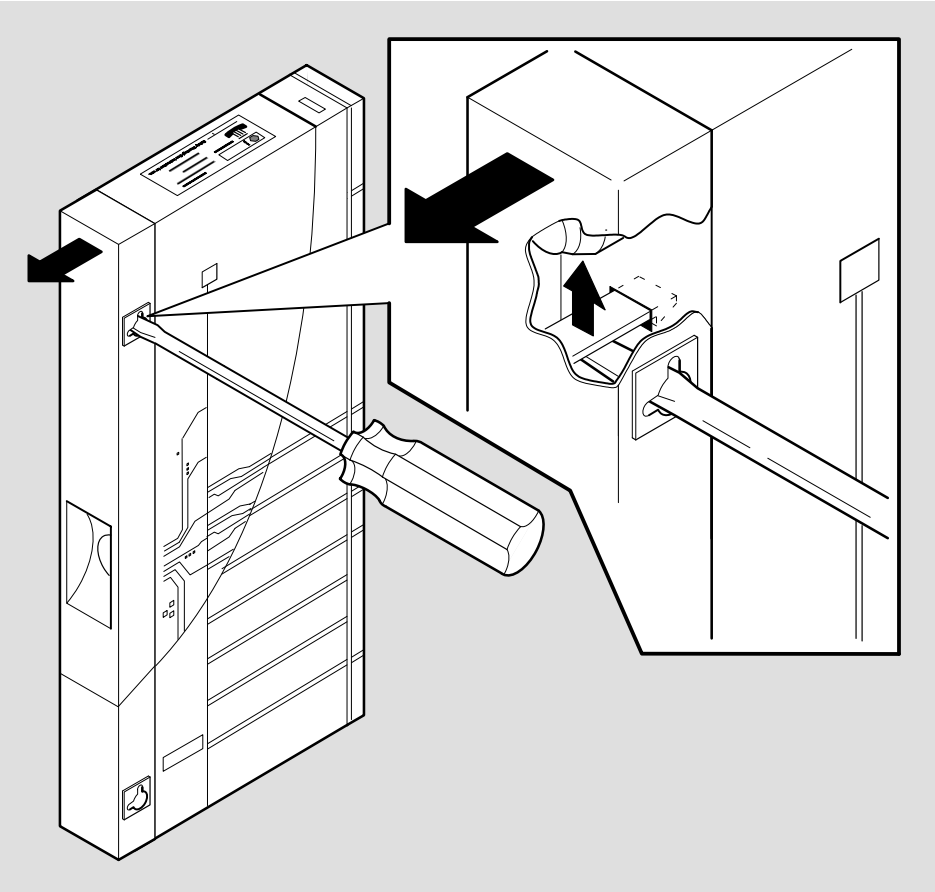

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Figure 2–2: Standalone Configuration – ThinWire Connection

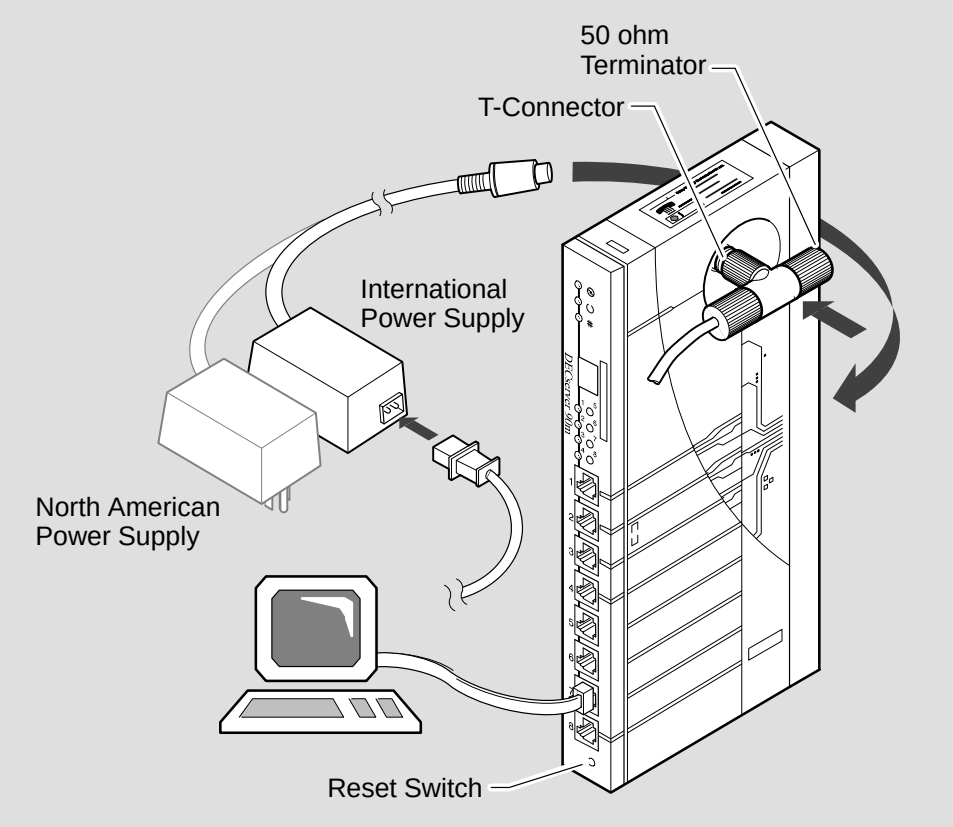

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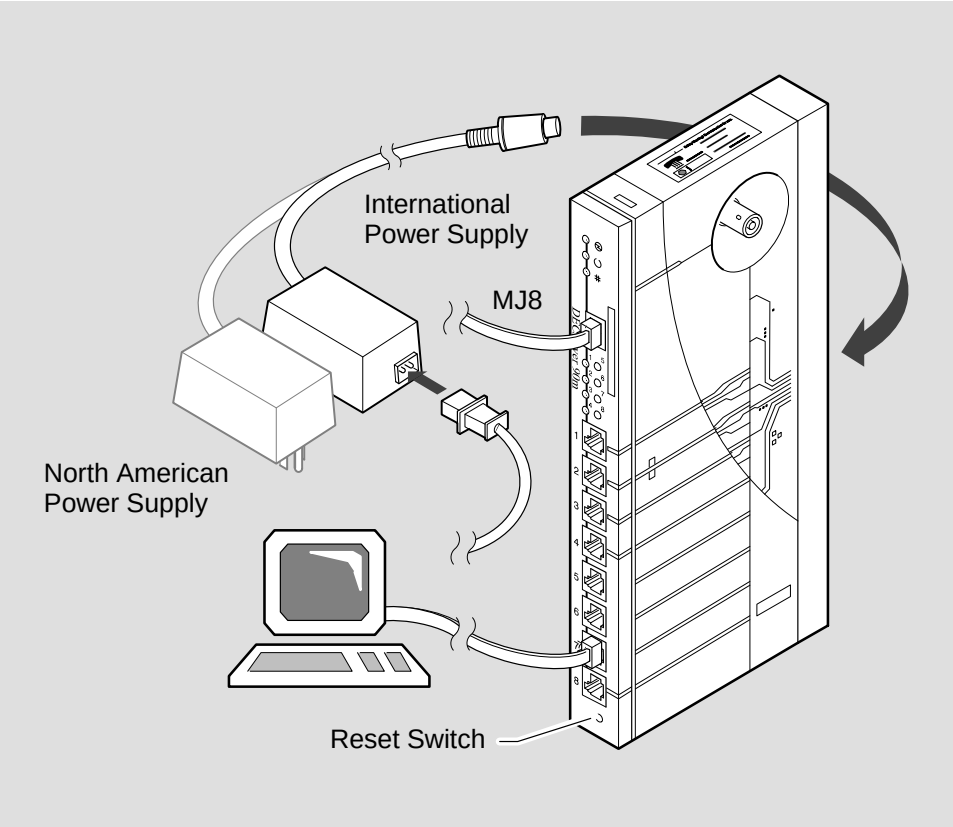
Figure 2–3: Standalone Configuration – 10BaseT Connection



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2.1.2 Backplane Installation

To install the DECserver 90M in the DEChub 90 Ethernet backplane, perform the following steps:

1. Remove the back cover (refer to Figure 2–1).
2. Place the lower mounting tab, located on the back of the DECserver 90M, in the appropriate mounting slot on the backplane (refer to Figure 2–4).
3. Rock the unit into place. You hear a click when the device is securely latched in place.
4. Make sure the power unit is secured in the backplane.

5. Secure a ThinWire connection or terminator on the backplane BNC connector.

6. Verify that the power LED is on and that the DECserver 90M is running the self-tests.

7. Optionally, attach a device configured with the following settings to the console port (default is port 1) using a cable terminated with an MJ8-compatible (RJ45) plug.

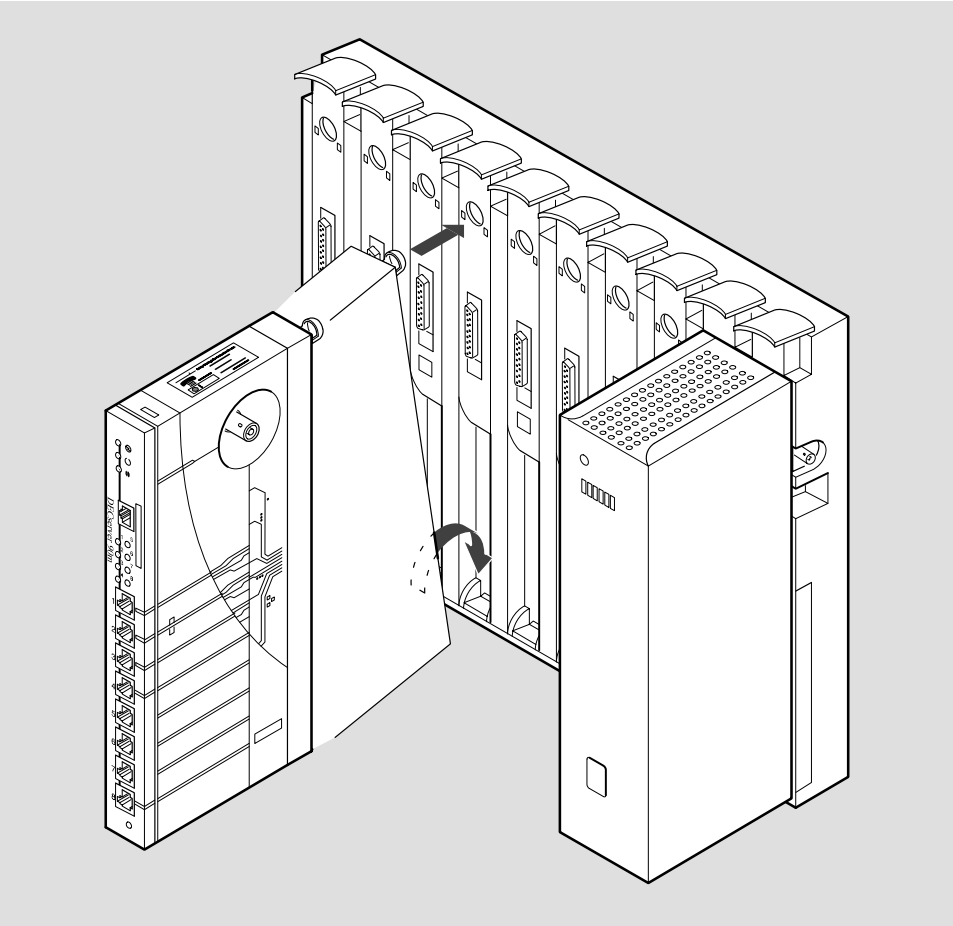
Character Size	8
Flow Control	XON
Parity	NONE
Stop Bits	Dynamic
Input Speed	9600 baud
Output Speed	9600 baud

8. Verify that the DECserver 90M successfully ran all the self-tests.

NOTE

You can install or replace (hot-swap) the DECserver 90M in a functioning DEChub 90.

Figure 2–4: Backplane Installation



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2.2 Running the DECserver 90M Self-Tests

The DECserver 90M runs a series of self-tests when you turn on the power and reports test status through the DECserver 90M LEDs (refer to Figure 1–1).

If the DECserver 90M is not properly connected to an Ethernet LAN (refer to Section 2.1), the network loopback self-tests fail.

The following list describes the status of the LEDs during self-test.

- Initially, all LEDs go on briefly, then go off, leaving only the power LED on.
- The Port Activity LEDs go on one-by-one and remain on, as the DECserver 90M completes each segment of self-test. All eight LEDs are on once the tests have run successfully.
- After successful completion of the self-tests, the System OK LED is on and the eight port LEDs go off.

To reset the DECserver 90M to the factory-default settings, press the Reset switch after port 7 LED goes on, but before port 4 LED goes on during self-test. Keep the Reset switch depressed until the Network OK and System OK LEDs flash rapidly. This indicates that the DECserver 90M has been reset to the factory settings.

NOTE

If a self-test pattern halts, an error condition has been detected (refer to Chapter 3).

2.3 Loading the DECserver Network Access Software

Before you load the software, optionally attach a terminal to the console port. The DECserver 90M displays status messages on the console terminal while the boot sequence is running. Status messages indicate the Ethernet address of the DECserver 90M, the name of the load image it is looking for, and the current stage of the boot process.

2.3.1 Booting From Flash RAM

Once the self-tests are complete, the DECserver 90M checks for Flash RAM. If Flash RAM is present, the DECserver 90M begins the boot sequence to load the software from Flash RAM. Port Activity LED 4 goes on to indicate a Flash RAM boot sequence is in progress. A typical Flash RAM load takes about 10 seconds.

If you want to abort a boot from Flash RAM, it is only during these 10 seconds when the software is loading that you can abort the Flash RAM load by pressing the Reset-to-Factory button until Port Activity LED 4 blinks.

2.3.2 Booting From the Network

If you do not have Flash RAM or the correct image is not found in Flash RAM, the DECserver 90M proceeds to perform a network load. When you start the boot process, the Network OK LED blinks continuously and the system OK LED remains on indicating that the DECserver 90M is attempting to load the software from the network.

During the network boot sequence, the DECserver 90M searches for a load host. The DECserver 90M tries both MOP and BOOTP protocols in a factory-defined order. The boot sequence includes a wait period after passing through all the boot protocols. Once the DECserver 90M finds a load host, it records the protocol and load host in its permanent database. The software is then downline loaded from the load host.

Port Activity LEDs 6, 7, or 8 go on to indicate which protocol the DECserver 90M is using to downline load the software. Port Activity LED 5 goes on to indicate that all attempts to find a load host have failed and that the DECserver 90M will remain in a wait state for a designated period of time before trying again. Port Activity LED 4 goes on to indicate the software is being booted from Flash RAM (refer to Table 2–1).

Table 2–1: LOAD and DUMP Protocols

Port LED	Meaning
4	Booting from Flash RAM
5	Waiting to retry
6	Ethernet BOOTP or dump
7	ISO 8802/3 MOP load or dump
8	MOP load or dump

For more information about installing the software, refer to the appropriate DECserver Network Access Software Installation documentation.

2.3.3 Using Console Commands to Boot

If you program Flash RAM with a nonstandard boot image name and a load host is not available, pressing the reset-to-factory button may leave the DECserver unbootable. A nonstandard boot image name is any name other than MNENG2. To allow booting of a nonstandard boot image name, perform the following steps:

1. During the boot sequence of the DECserver 90M initialization process, press Ctrl/B two times consecutively.

   Ctrl/B Ctrl/B

   The boot process stops and the DECserver returns the following console prompt:

   ```
   >>>
   ```

2. At the `>>>` prompt, you can enter `H` to invoke help.

   Entering `H` provides minimal help text to describe the interactive boot mode commands available. Table 2–2 lists the boot mode commands and summarizes the help text that displays when you invoke `H`.

Table 2–2: Interactive Boot Mode Commands

This command...	Means...
B	Boot the DECserver software.
B *name*	Boot the DECserver software *name*.
B *media:name*	The DECserver looks for the software *name* from the *media* (Flash RAM or the network).
B/M	Boot the maintenance software for the DECserver.
B/S	Boot the standard software for the DECserver.
H	Provide help.
I	Initialize the DECserver.
R	Reset to the factory settings and initialize the DECserver.

You have several options when you use the B command.

- B — This command, without an argument, starts a new boot sequence to load the DECserver with an executable image using the default boot parameters.
- B *name* — This command and the argument *name* specifies a nonstandard boot image. The DECserver looks for the software *name*; first from Flash RAM, then from the network.
  - B MNENG2 — This command instructs the DECserver to look for the MNENG2 software image first in Flash RAM, then from the network.
  - b /tftp/serversw — This command instructs the DECserver to look for image /TFTP/SERVERSW; first in Flash RAM, then from the network. If you want lowercase letters, you have to use quotation marks. For example:

    ```
    b "/tftp/serversw"
    ```

  - B "" — This command and the quotation marks (explicit null name) instruct the DECserver to search for any image in Flash RAM. If the DECserver is unable to find an image in Flash RAM, then it loads from the network. The network load host defines this software and is typically based on the Ethernet MAC address of the DECserver.

- B *media:name* — The media name specifies which boot media to use.
  - FLA: — Use Flash RAM. For example:

    ```
    B FLA:MNENG2
    ```

  - ETH: — Use the network to find a load host. For example:

    ```
    B ETH:MNENG2
    ```

  - FLA:ETH: — Use Flash RAM first, and if that does not work, then use the network to find a load host. For example:

    ```
    B FLA:ETH:MNENG2
    ```

- B/M — This command boots the maintenance mode software for the DECserver. The network load host defines this software and is typically based on the Ethernet MAC address of the DECserver.
- B/S — This command boots the standard system software for the DECserver. The network load host defines this software and is typically based on the Ethernet MAC address of the DECserver.
- H — This command displays the help text that describes the interactive boot mode commands.
- I— This command initializes the DECserver using the default boot parameters. All normal self-tests are performed.
- R — This command resets the factory-settings and initializes the DECserver. This command requires verification. Enter YES if you want to reset the DECserver to factory settings.

2.4 Verifying the Operation of the DECserver 90M Ports

To verify the operation of each port, perform the following steps:

1. Connect a terminal to the port you want to test.
2. Press the Return key two or three times to set the operating speed (autobaud) of the port.
3. Type a character on the terminal and observe each Port Activity LED for a reaction. The Port Activity LED should turn on, indicating that the corresponding port is in use. Additional characters should then cause the LED to blink.

3

Troubleshooting

This chapter provides troubleshooting information for the DECserver 90M. This chapter also provides problem and solution information tables to help you isolate hardware, software, or network problems.

Before servicing the DECserver 90M, you should:

1. Verify that you have properly installed the DECserver 90M.
2. Note the fault condition.
3. Isolate the problem.

3.1 Operating Problems

When troubleshooting self-test or boot problems, connect a terminal to the console port on the DECserver 90M to view error messages. Port 1 is the default console port.

NOTE

For descriptions of error messages and tips on troubleshooting DECserver 90M problems, refer to the *Network Access Server Problem Solving* manual.

Table 3–1 lists some possible hardware, software, or network problems and suggested solutions.

Table 3–1: DECserver 90M Troubleshooting

Problems	Possible Causes	Action
The self-test fails, and the network LED does not go on.	The ThinWire Ethernet port or 10BaseT connector is not connected to a properly terminated network.	Terminate the network correctly.
	A fatal hardware error occurred.	Replace the DECserver 90M.
The port activity LEDs do not respond when characters are typed on the console keyboard.	Interface cable may be disconnected or faulty.	Secure or replace the cable.
The port does not respond to the console terminal.	The port may be faulty.	Refer to the *Network Access Server Problem Solving* manual.
	Port and terminal parameters may be set incorrectly.	Refer to the *Network Access Server Problem Solving* manual.
The DECserver 90M power LED does not go on.	The power cord is disconnected from the outlet.	Connect the power cord.
	The DECserver 90M is not receiving +5VDC.	Check power supply connection.
	Reseat the power supply, backplane installation only.	Replace the power supply.
	The LED is bad.	Replace the DECserver 90M.

Table 3–1 (Cont.): DECserver 90M Troubleshooting

Problems	Possible Causes	Action
The network LED is not on.	The network is down.	Determine the network status.
	Check network connectivity.	Run MOP loopback or MOP console carrier session tests.
	The Ethernet connection may be disconnected.	Reconnect the Ethernet cable.
	The communication port may not be terminated.	Terminate the T-connector on the communications port.
	The 50 ohm termina-tor(s) to the T-connector may have disconnected.	Reconnect the terminator(s).
There is no response at the Local prompt.	Terminal connection to the console port may be broken.	Secure the console terminal cable to the console port.
The DECserver 90M cannot connect to a service on the LAT network.	The service is not available.	Refer to the *Network Access Server Problem Solving* manual.
	LAT software is not installed on the host system.	Refer to the *Network Access Server Problem Solving* manual.
	The host name is not in the local database.	Refer to the *Network Access Server Problem Solving* manual.
	Group Codes are not enabled.	Refer to the *Network Access Server Problem Solving* manual.
	The host is not on a local area network.	Refer to the *Network Access Server Problem Solving* manual.
The DECserver 90M cannot connect to a host on the network throughTelnet.	Internet and Telnet parameters are not set or are set incorrectly.	Refer to the *Network Access Server Problem Solving* manual.

Table 3–1 (Cont.): DECserver 90M Troubleshooting

Problems	Possible Causes	Action
Printer does not print or prints incorrectly.	Printer port and baud rate do not match.	Reset printer and port baud rates to match.
The printer port LED does not go on.	The printer is disconnected.	Connect the printer.
The printer is not acknowledged by the printer port.	The port may be set incorrectly.	Refer to the *Network Access Server Problem Solving* manual.
	Check printer port access.	Refer to the *Network Access Server Problem Solving* manual.
	Flow control is not set.	Refer to the *Network Access Server Problem Solving* manual.
The power LED is on, the self-test OK LED is on, and the network LED is blinking.	The DECserver 90M cannot find the load image.	Ensure LOADING is enabled on the host. Reinstall the software to replace the load image.
The port activity LED does not blink when port traffic is present.	Port characteristics may be set incorrectly.	Verify settings using the SHOW PORT *n* command.

A
Specifications

This appendix lists the specifications for the DECserver 90M.

A.1 Physical Specifications

Table A–1 lists the physical specifications for the DECserver 90M.

Table A–1: Physical Specifications

Dimension	Value
Height	3.18 cm (1.25 in)
Width	27.31 cm (10.75 in)
Depth	12.70 cm (5.0 in)
Weight	0.77 kg (1.7lb)

A.2 Environmental Specifications

The DECserver 90M is designed to operate in an office environment or in equipment room environments, such as telephone closets or satellite equipment rooms. The operating and shipping environments are described in Tables A–2 and A–3.

Table A–2: Operating Environment

Dimension	Value
Temperature	5 C to 50 C (41 F to 122 F)
Maximum rate of change	20 C/hr (36 F/hr) change
Relative humidity	10 % to 95 % (noncondensing)
Wet-bulb temperature	32 C (90 F) maximum
Dew point	2 C (36 F) minimum
Altitude	Sea level to 2.4 km (8000 ft)
Air flow	Convectively cooled. A minimum of 10 cm (4 in) of space must be provided on both ends of the unit for adequate air flow.

Table A–3: Shipping Environment

Item	Value
Temperature	–40 C to 66 C (–40 F to 151F)
Relative humidity	10 % to 95 % (noncondensing)
Altitude	Sea level to 4.9 km (16000 ft)

A.3 Power Specifications

Table A–4 lists the DECserver 90M power supply specifications and Table A–5 lists the DECserver 90M power specifications.

Table A–4: Power Supply

Item	Value
Voltage (North American)	104 Vac to 128 Vac (nominal 120 Vac)
Voltage (International)	208 Vac to 256 Vac (nominal 240 Vac)
Current at 120 V	0.25 amps
Current at 240 V	0.125 amps
Frequency	50 Hz to 60 Hz
Power consumption	16 W
Output voltage	5.1 Vdc
Output current	1.8 A

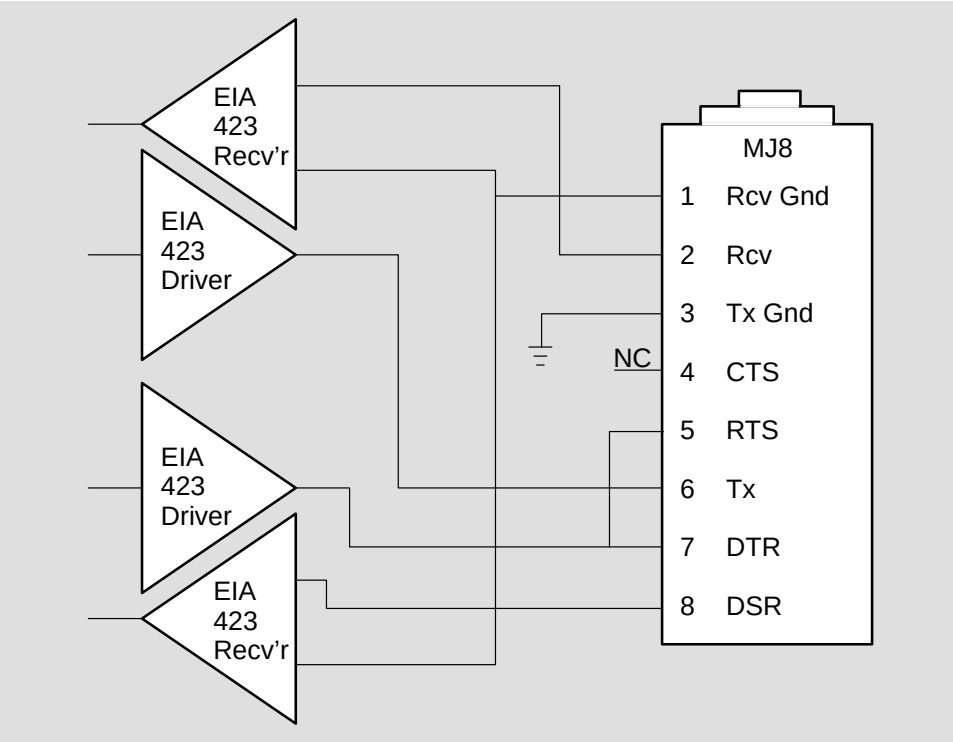
Table A–5: Decserver 90M Power Specifications

Item	Value
Input voltage	4.75 to 5.25 Vdc
Input current	1.2 A

A.4 DECserver 90M Connector Pin Out

Pin out for the DECserver 90M was designed for compatibility with Open DECconnect. Figure A–1 shows the circuit connections for each port.

Figure A–1: Port Circuit



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A.5 Cable Connector Pin Out

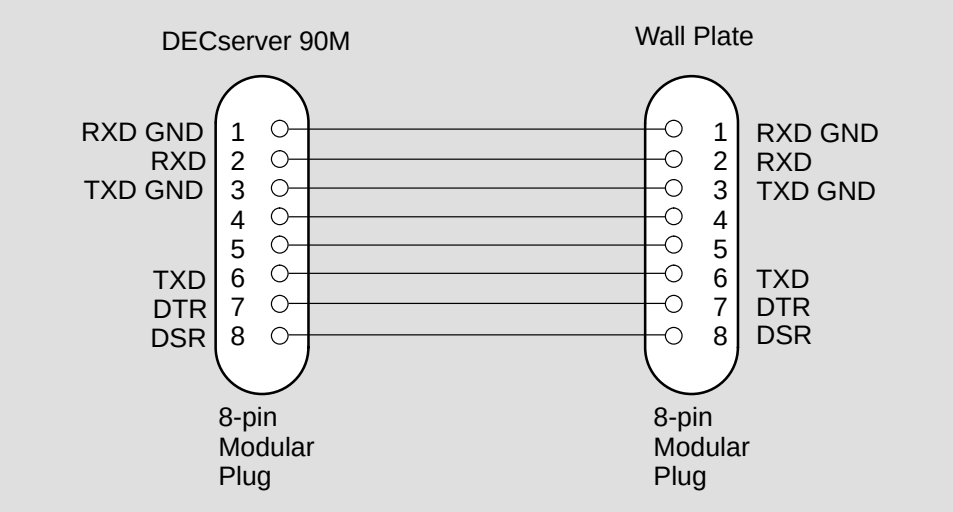
This section provides wiring diagrams for the serial communication cable connectors listed in Table A–6.

Table A–6: Cable Connectors

Item	Value
BN25G	8MP-to-8MP (modular plug) equipment cable
BN24H	8MP-to-6MMP (modified modular plug) office cable

The BN25G is a twisted-pair (four twisted pairs) cable with standard 8-pin modular plugs. Figure A–2 shows the wiring configuration for the BN25G cable. This is the standard cable used to connect an asynchronous port on the DECserver 90M to an Open DECconnect wall plate.

Figure A–2: BN25G Equipment Cabling Wiring Diagram



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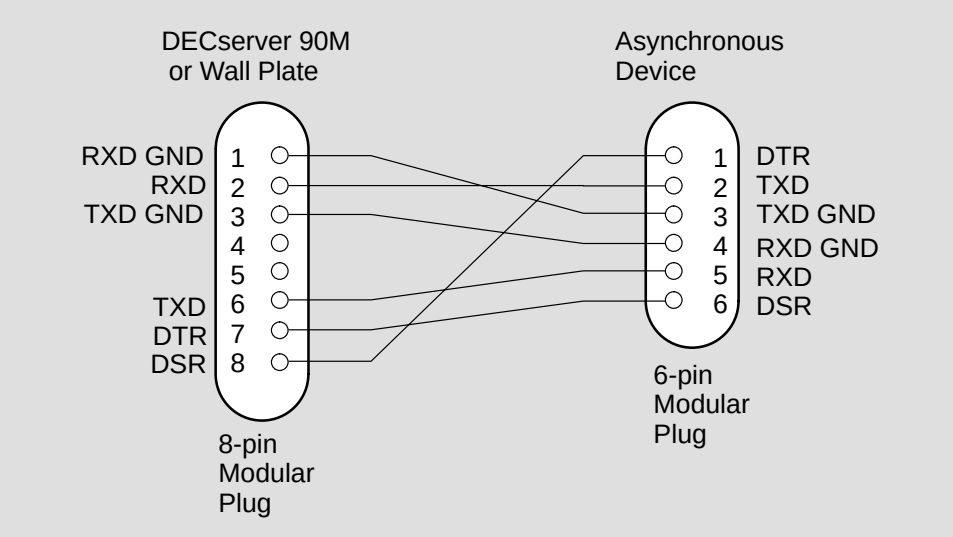
The BN24H is a twisted-pair (three twisted pairs) cable with a standard 8-pin modular plug on one end and a 6-pin modified modular plug on the other end. Use this cable to connect the DECserver 90M to an MMJ connector on an asynchronous device. You also use the BN24H when connecting an asynchronous device to a DECconnect wall plate.

Use an H8584-AA adapter when connecting the DECserver 90M to existing MMJ wiring. The adapter uses a standard 8-pin modular plug on one side and a 6-pin modified modified plug on the other end.

Figure A–3 shows the wiring configuration for the BN24H cable and H8584-AA adapter.

Figure A–3: BN24H Office Cable Wiring Diagram



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